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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 313

Contribution from the Bureau of Animal Industry
A. D. MELVIN, Chief

Washington, D. C. November 13, 1915

FEATURES OF THE SHEEP INDUSTRIES OF UNITED STATES, NEW ZEALAND, AND AUSTRALIA COMPARED

By

F. R. MARSHALL, Senior Animal Husbandman in Sheep and Goat Investigations, Animal Husbandry Division

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INTRODUCTION.

In July, 1914, funds became available to the Animal Husbandry Division to be used "for the importation of Corriedale and other promising breeds of sheep for breeding purposes." In August, 1914, the writer reached New Zealand to study the breeds of sheep in that country, and later spent six weeks in Australia visiting sheep stations, shearing sheds, wool markets, and officials of agricultural departments conducting experimental and educational work relating to sheep raising. As a result of these observations and study, it was decided to use the funds available for the purchase of a foundation flock of Corriedales, and 53 ewes and 10 rams of that breed reached the Federal quarantine station at San Francisco on December 31, 1914. The adaptability of these sheep and their offspring to conditions in the Rocky Mountain States will be tested and reported in the future. The history and characteristics of Corriedale sheep are discussed later on in this bulletin.

6830°—Bull. 313—15——1

American sheep raisers have not remained wholly unacquainted with the ideas and practices of Australian flock masters. During the past year lectures delivered in western States have done much to familiarize sheep raisers with the very efficient Australasian system of getting wool from the sheep to the mill. For some years persons connected with the wool trade have made it clear that in many phases of sheep raising, especially that of preparing wool for market, American methods compare very poorly with those followed in Australasia.

With conditions as they are at present, when sheep raising contains so much of promise and also of uncertainty, it is well to have at hand as much information as possible regarding the fundamental principles that have so firmly established the sheep industry in Australasia and made these far-off countries so prominent for both quantity and quality in the world's wool trade. Because of these considerations, the impressions gained from a comparatively rapid view of sheep and wool matters in New Zealand and Australia by one having the American viewpoint have been prepared for publication.

GENERAL CONDITIONS IN NEW ZEALAND'S SHEEP HUSBANDRY.

Sheep raising in New Zealand is conducted on lines midway between those followed in our farming States and in the range States. In comparison with American farm flocks, those of the smaller holdings in New Zealand have an advantage in that they rarely number less than 400 head and are a very important, if not the chief, source of revenue from the holdings.

The total area of occupied land in New Zealand is under 45,000,000 acres. Of this, 5,000,000 acres have been plowed and sown to artificial grasses for grazing, while over 9,000,000 acres have been surface-sown to artificial grasses without plowing. The first-mentioned lands support from 1 to 8 sheep per acre for the year, while the latter average from one-half to 2 sheep per acre. Grass is the principal crop. With a growing season of 10 months and a well-distributed rainfall, it is found profitable to keep in grass for stock alone lands valued as high as $150 per acre. Nearly one-half the occupied land is in holdings of over 5,000 acres, mainly used for sheep, there being 90 holdings of over 50,000 acres each against 18,694 holdings of from 50 to 200 acres.

The number of sheep kept has advanced from about 19,000,000 in 1896 to 24,595,405 in April, 1914. This enumeration for April corresponds to November in the United States, coming after a large proportion of lambs have been marketed, and corresponding quite closely to the numbers of the shearing season to follow. Wethers, rams, and ewes under breeding age comprise about one-half the sheep

population. The number of sheep slaughtered for food purposes during the 12 months ended March 31, 1914, was 4,019,831, and of lambs 4,338,180. The 1913 exports numbered 3,538,488 lamb carcasses and 2,201,365 carcasses of mutton.

New Zealand's flocks number 21,500, and the average size of flock has increased from 1,081 in 1896 to 1,124 in 1913. About one-half the sheep are in flocks numbering less than 2,500 head, while seven-eighths of them are owned in flocks numbering over 500 head each.

A contrast of these figures with others for the leading farm-sheep State and the leading range-sheep State in this country is of interest.

Sheep in New Zealand, Ohio, and Wyoming.

State.	Total land area.	Sheep in State.[1]	Holdings over 100 acres.[2]	Holdings having sheep.	Average size of flock.
	Acres.	*Number.*	*Number.*	*Number.*	*Number.*
New Zealand	66,292,232	24,595,405	25,702	21,527	1,124
Ohio	26,073,600	3,263,000	94,754	71,556	55
Wyoming	62,459,160	4,472,000	9,584	1,643	2,938

[1] Jan. 1, 1914. [2] In 1910.

It is partly because of necessity that New Zealand lands are so largely devoted to sheep raising. A good quality of mutton and wool can be produced without the feeding of grain, the production of which is not favored either by the soil or by labor conditions. On the other hand, the place occupied by sheep is evidence of the profits obtainable when valuable lands are devoted to well-managed flocks of sufficient size to insure for them the lively interest and careful tending essential to their well-being and which in our farming States is the exception rather than the rule.

While it is true that the values of other commodities do not call for other uses of land as in our farming States, this fact is offset by the lower prices paid for mutton and lamb in New Zealand. The advantage enjoyed there in the price of wool is quite largely due to the exercise of superior skill in preparing the clips for the market. It is true also that New Zealand flockmasters have no predatory wild animals to contend with. The problem of the domestic dog is not absent, however, but the dog is held in check, because the general and predominating interest in sheep gives support to well-enforced laws. Our farming States have experienced a decline in sheep raising on account of unequal competition from cheap western lands. The force of that competition no longer exists, and the agriculture of the Middle and Eastern States will not again exhibit its most profitable status until the flocks of sheep therein are larger and much more numerous than at present. The main difficulty in the way is

lack of appreciation of the results obtainable from carefully tended flocks.

GENERAL CONDITIONS OF SHEEP HUSBANDRY IN AUSTRALIA.

Even a superficial study of the peculiar phases of the sheep industry in the country where it has its greatest magnitude must be of great interest and may be very profitable. While conditions and customs of sheep raising vary greatly in Australia, the variations are less marked than in the United States. The sheep industry of Australia is still in the main what an American would call a "range proposition." Crossbreeding and mutton production are of less concern even than in our Rocky Mountain and other western sheep-raising States.

New South Wales, Victoria, and Queensland possessed 85 per cent of the 83,263,686 sheep in Australia in 1912. Queensland is the largest and least developed of the three States mentioned. Eighty per cent of its land is occupied, 74 per cent being held under Government lease or license. On the 343,000,000 acres occupied in Queensland there are 3,119 flocks which average 6,500 sheep. Data regarding size of holdings and size of flocks are available only for New South Wales and Victoria, consequently figures for only these two States, which possess 60 per cent of the Commonwealth's sheep, are shown in the following table, and data for the western United States are included for comparison:

Sheep in New South Wales, Victoria, and the western part of the United States.

Section.	Total area.	Total area owned.[1]	Per cent of area having 15 inches or less rainfall.	Area under lease or license.	Total acres in holdings over 100 acres.
	Acres.	*Acres.*	*Per cent.*	*Acres.*	*Acres.*
New South Wales	198,054,420	57,818,023	39.4	124,590,163	181,195,753
Victoria	56,245,760	31,055,920	37.0	14,443,191	44,502,618
Rocky Mountain States [2]	398,599,680	47,016,786	72.0	.....	45,155,275
Southwestern States [3]	319,175,040	124,951,701	15.0	.....	113,281,343
Pacific States [4]	203,580,800	51,328,789	37.0	.....	48,027,762

Section.	Total sheep.	Sheep per acre on holdings over 100 acres.	Number of flocks.	Average size of flock.	Sheep in flocks over 1,000.
	Number.	*Number.*	*Number.*	*Number.*	*Per cent.*
New South Wales	38,855,861	0.21	25,549	1,520	84.5
Victoria	11,892,224	.25	24,838	480	59.7
Rocky Mountain States [2]	18,196,574	.308	11,323	1,607	86.8
Southwestern States [3]	6,382,426	.056	11,881	537	80.6
Pacific States [4]	5,592,167	.116	12,368	452	89.7

[1] Reported as in farms for United States.
[2] Idaho, Montana, Nevada, Utah, Wyoming, Colorado.
[3] Texas, Arizona, New Mexico.
[4] California, Oregon, Washington.

Much of the land in Australia now used as sheep runs is destined to be used for farming. "Closer settlement" is actively assisted by all the State governments. Taking the Commonwealth of Australia as a whole, one-third of its land area lies in regions of less than 10 inches of annual rainfall. In these drier sections salt bush furnishes a large part of the sheep feed and is considered most satisfactory for dry sheep. Outside these sections the country enjoys peculiar advantages favoring sheep raising, particularly in comparison with those areas of the United States which now and for an indefinitely long period can be used most profitably for the grazing of sheep.

In considering sheep raising in Australia, it should always be borne prominently in mind that the flocks, or "mobs," are not kept collected and under the care of herders while pasturing. The lands are fenced into "paddocks" of from 500 to 10,000 acres in size, and the sheep run safely at liberty in these. The lessening of labor by this plan is no more important than the greater thrift of the sheep as compared with those in charge of even the best herders.

The amount of pasturage procured from each acre is much greater under the paddock plan. The fact that the sheep are very widely spread out at all times and never driven over dusty trails to and from dusty bedding grounds gives cleaner and lighter-shrinking wool from the Australian flocks, aside from the advantage of some regions in having soils that are not inclined to blow. Fencing the sheep runs and dividing them into paddocks of suitable size requires labor and expense, which, however, are much more than counterbalanced by subsequent saving in the labor of handling the flocks and in the extra thrift of the sheep. In many cases sheep are mustered or rounded up but once in the year, at shearing time. Having their full liberty in paddocks from 500 to 10,000 acres in size, they are under practically natural conditions. The absence of wild animals from the paddocks and the climate together avoid the necessity for attention at lambing time, except in the case of valuable stud ewes. On the other hand, difficulties with hired labor are greater in Australia and wages little if any lower than in the United States. The blowfly is a serious pest in much of the country and necessitates frequent inspections, as well as crutching and dipping, which involve expense.

Droughts, which occur with some regularity, are exceedingly serious. The number of sheep may be reduced by nearly one-half over large areas once in 10 years, entailing desolation and serious loss, especially to the smaller owners who can not move their stock and to owners who have stocked their lands to their full capacity in normal seasons.

Vegetation recovers with exceeding rapidity at the breaking of a drought, and with the climate aiding the Australian Merino sheep's habit of breeding at practically any time of the year, the flocks are

quickly reestablished. Serious and widespread as are the Australian droughts, the handicap they impose upon the sheep business is not so great as appears at first sight. Only in such times is it necessary to feed the flocks in that country. With extra feed available, less is needed to maintain an animal through a drought period than through a period of cold and storm such as is experienced with greater frequency by American flocks.

TENURE OF PASTORAL LANDS.

The high rank of the Australian and New Zealand sheep raisers is due in part to the newness of their countries. Many areas now devoted to sheep raising will ultimately be used for crop production. The fact that settlement is in its earlier stages affords greater scope and opportunity for pastoral pursuits. In the United States the sheep raiser has repeatedly been forced by the farmer to retreat to the drier, rougher, and more remote sections. It is a question whether the value of the total output of some sections has not been reduced as a result of the abandonment of grazing consequent upon the taking up of a few claims for farming.

In large part, however, the efficiency of the Australasian pastoralist is due to the system under which he secures and holds his grazing lands. No Australasian sheep owner uses public domain without charge; neither is he in any danger of having the lands he has leased grazed by stock other than his own. In some "back" sections the cost of his lease may be practically nominal, but it gives him full use of the land and renders him liable to higher rates at such time as settlement has approached him and the lease value of the land has advanced. The conditions governing leasing, like those concerning the acquiring of freehold, vary considerably with the different States.

LAND LEASING.

The leasing policy appears to have been found satisfactory by the governments of the various States and is generally approved by the lessees. The acreage of land under lease in the Australian Commonwealth increased from 1901 to 1912 by 19 per cent, or over 137,000,000 acres, and in the latter year constituted 45 per cent of the Commonwealth area. New South Wales had 62 per cent of its area under lease, Victoria 25 per cent, and Queensland 74 per cent. The last-named State in 1912 granted 348 leases for grazing homesteads, averaging 11,000 acres each, and 223 leases for grazing farms, averaging 8,228 acres.

In leasing provision is made for later resumption of lands by the Crown for division for smaller pastoralists or farmers. In such cases the original lessor retains his own central homestead and receives compensation for improvements upon lands resumed by the Crown.

The Australian pastoralist who pays for the use of his lands according to a long-time contract is at a great advantage over the American pastoralist who enters into unlimited competition for wholly temporary and unlegalized use of public lands. The Australian enjoys the control of the land he uses, and the length of his tenure encourages and justifies him in making investments necessary for the proper utilization of such land. He knows he is safe in making a generous expenditure of his time and capital in breeding his flocks to the highest point of efficiency, because after the result is attained he still has time under his lease to reap the benefits of his accomplishment. This is true, also, in regard to construction of fences, shearing sheds, and accommodations for labor. He builds for himself a reputation for producing a high quality of wool and for preparing it for market in an attractive and reliable manner, and is assured of remaining upon the same land long enough to reap the benefits of the reputation established for his output.

Too commonly, and not without justification, the American wool producer argues that an investment in improved stock or in the appliances and intelligence required to secure a good reputation for his product can not safely be undertaken because of the uncertainty of his continuing in business long enough to reap the benefits. It is well known that under this lack of system the public range has been so overcrowded as to diminish most seriously the amount of feed produced, and consequently its value to the Nation. While it is true that such use as is made of the public domain is made without charge to sheep owners, it is quite plain that a more permanent and better-managed industry would result from a settled policy of leasing or apportioning for fixed periods, under a permit system, the remaining public lands suitable chiefly for grazing, and in blocks of the size necessary to permit the most economical management.

Users of the American public domain are themselves becoming more agreed as to the desirability of a definite policy for control and improvement of the public grazing lands, even at added cost to themselves. Such a policy is urgently needed to secure for the country the maximum production from its 290,000,000 acres of unappropriated and unreserved public lands lying mainly in the Western States.

The State of New South Wales, Australia, is divided into 67 pastoral districts. For each district there is a pastures protection board, consisting of eight members, elected by the landowners and stock owners within the district. Acting through these the stock branch of the State Department of Agriculture enforces the provisions of the pastures protection act. The members of the local boards are themselves stock owners and enforce the laws in respect to diseases, quarantine and movement of sheep, fencing against rabbits, and payment of bounties for destruction of noxious animals.

The expenditures of the boards are paid from funds derived from rates levied upon the land and stock within the district.

FLOCK MANAGEMENT.

In general the policies of Australian flockmasters are more continuous and more completely worked out than in the case of the general run of American flocks. Remoteness from markets and limited crop production have occasioned less attention to mutton and more to wool. The method of selling the wool and the system of land tenure have facilitated progress in breeding and in management. The majority of sheep raisers appreciate the value of good blood and careful matings and steadily adhere to a plan of breeding to produce sheep having the peculiar characters necessary to adapt them to the particular sections.

Whether it is due to a peculiar attitude toward his business, the insistence of interested capital, or the favorableness of the climate, the general custom of having the station manager reside permanently upon the property he superintends is in marked contrast to the custom of American sheep ranchmen, and in general the management is in most respects more efficient.

It has already been explained that Australasian flocks running at liberty in large fenced paddocks require and receive no such continuous shepherding as is necessary in American flocks. Although the flocks of considerable size are all of Merino blood, the propensity to herd closely is not desired. The sheep in a paddock form into groups, each of which keeps to its own general area. The sheep are rounded up or driven only when required for shearing, classing, etc. Practically no supplementary feed or cultivated grasses are used. Part of the labor saved in herding is offset by the employment of boundary riders to attend fences and wells, and a great many men are needed to keep rabbits in check. The number of hands steadily employed upon a sheep station in Australia is less than for an American ranch carrying a similar number of sheep, while the number of extra men employed at shearing time is greater.

CLASSING SHEEP.

Ewes are ordinarily classed for breeding just previous to being shorn. This time affords the best opportunity to judge of the fleece and divide the ewes into uniform lots, each of which is later mated with rams chosen to improve defects of fleece or form. Classing at this time also gives fleeces of fairly uniform character, which facilitates the work of the wool classer who is always employed at shearing time. In some cases a lot of young ewes once classed up are kept in the same groups as long as they are bred from. In other cases classing of all ewes is done each year.

This division of the ewes into uniform lots is deemed to be of greatest importance. On one station visited, where only wethers are kept, it is the custom to go over purchased stock before shearing and make an examination of each fleece. Once assorted in this way a flock may run for several seasons with only such re-sorting as is made necessary by mixing or the presence of strays. After shearing, the ewes need only such attention as is given by the boundary riders until breeding time, when mustering is necessary only to remove the rams at the close of the season.

LAMBING RETURNS.

The lambing returns do not differ widely from western American figures. Three per cent is the common proportion of rams used. Lamb crops vary around 80 per cent, less in young ewes and more in stud ewes. Where the blood of British or mutton breeds has been introduced larger lamb crops result.

Fall-dropped lambs are separated from their dams at shearing time and, though only 3 to 5 months old, are also shorn. Shearing at this age allows better growth of the lamb and gives their yearling fleeces greater uniformity in length and quality.

BUILDINGS.

Aside from the shearing sheds, no buildings for sheep are seen except occasional sheds in near-by paddocks to keep the sheep dry as they come up for shearing. No feed of consequence is harvested or stored. In drought times purchased feed may be fed, but the commoner plan is to ship the sheep to points where grazing can be leased.

BREEDS AND TYPES OF SHEEP IN AUSTRALIA.

Over 70 per cent of the sheep in Australia to-day are of Merino breeding. Of the crossbreds that make up a large part of the balance, most are from Merino ewes. Australia's sheep industry began with sheep of Spanish Merino blood imported from the Cape of Good Hope and from England, late in the eighteenth century. Considerable numbers of Saxony Merinos were taken to Tasmania and that State for some time produced many of the rams most highly esteemed on the mainland. The Australian Merino has therefore sprung from the same original stock as the American Merino. In the palmy days of fine-wool sheep breeding in Vermont many sheep were exported from that State to Australia. American Merinos are seldom spoken of by that name in Australia, but one frequently hears "Vermonts" referred to.

For an American, the point of greatest interest and value in Australian sheep husbandry is the type of sheep that has been evolved for the profitable production of wool. There is nothing in

material or methods available in Australia that can not be used in the United States. It has been stated that Australians are familiar with what they call the Vermont sheep and that the use of that blood has mainly been discontinued. In fact the terms used nowadays in Australia in referring to the "Vermont" sheep are far from complimentary, and would seem to overlook the improvement in density and quality effected by American Merinos. Objection is made to the excessive wrinkles on the body, to excess of oil in the wool, to shortness, and too great fineness of the wool. These objectionable features are considered to be indicative of and associated with a lack of constitutional vigor.

DIVERGENCE OF AUSTRALIAN AND AMERICAN MERINO STANDARDS.

It would be unwise and un-American to fail to give due weight to the Australian criticism of a type of sheep which is still largely kept in this country, especially since until recent years the standards of the two countries were quite similar. The plan of selling wool, whereby the price received by the grower is set by the manufacturer's buyer, enables the Australian to make a more accurate estimate of profit from various types of wool. The Australian argues that the extra price received for the very fine wools does not offset the value of the greater quantity of "robust" wool secured per acre of land used with the type of sheep now favored. The clearly defined areas of leased land, with no transfer from winter to summer range, also give an added advantage in determining production costs.

Corresponding to the A, B, and C types of American Merinos now recognized apart from the Rambouillet, Australia has the fine, medium, and strong types. None of these can be said to resemble the Rambouillet closely. The "strong" or "robust" wooled type produces a fleece of considerably greater clean weight than is obtained from the finer, tighter-wooled type. The greater bulk and length of the robust fleeces, together with the lessened amount of oil, give a much greater weight of clean wool per sheep than is yielded by the finer-wooled sheep. While the coarser wool may at times be worth less per clean pound than fine wool, it has for some years suffered no discount, and it is found easier to maintain in that uniformity of crimp and brightness that has much to do with fixing values. A further claim for the production of this robust wool is that the sheep which produce it are larger and stronger in constitution.

AUSTRALIAN OPINIONS AS TO ROBUST WOOL.

The following extracts from matter published in Australia in this connection shows the development of opinion in that country. In 1899 Mr. Jeffrey, Government wool expert in South Australia, wrote:

Fine Wool Versus Robust.—Because of the many different types in the Merino class, it is most important to know what particular type is most adapted

for the locality on which they are depastured. But on account of the varying conditions met with throughout Australia, such as difference in country, climate, etc., as was stated in an earlier portion of this chapter, no definite type can be suggested for each locality; still, taking for granted that the object of the wool grower is to keep sheep which will yield most money per head, and not sheep the wool of which simply realizes fancy prices per pound, some authorities maintain that, in most localities at any rate, financial advantage would be gained by the keeping of a more robust type of sheep than is generally found to-day. Whether such authorities be correct or not, it is a fact that the trend of wool is fast developing in the direction of a little more robustness or strength.

In proof of this some of the best known fine-wool growers in Australia, who have for years past obtained amongst the highest prices for their wool, are purchasing rams from well-known robust-wooled flocks, in which, for a considerable time, great attention has been paid to this type of wool, with the most satisfactory results.

It would be folly to suggest that the robust-wooled sheep, such as are found in South Australia, would be entirely suitable for every locality in Australia; still, a strain of stronger blood in most of the fine-wooled sheep would perhaps be of advantage.

In the drier or more arid parts, such as the Barrier district of New South Wales, the north of South Australia, and other similar localities, experience has proved that it is impossible to keep fine-wooled sheep with anything like the most satisfactory results. This type of sheep (if greasy) is much inclined to sweat, and the skin is too thin to withstand the severe punishment which is met with in such localities.

The hair follicles or bulbs on the surface of the skin are very susceptible to the withering effects of the climatic conditions met with there, and the somewhat tender or delicate fiber can not endure the hardships which are so common under such conditions.

All this will have more weight when it is remembered that wool has a tendency to become finer, and in the hotter and drier parts, should it be fine to start with, it generally goes "off" and becomes loose and open (particularly on the back), with the result that the dust and sand, which are so prevalent there, find their way right on to the very skin of the sheep, causing more or less injury to the fiber.

Further, on account of the excessive openness, the heat of the sun much more easily operates upon the wool, extracting from it the yolk, which is the very life of it, thereby leaving it tender, mushy, and lifeless.

On the other hand the robust or stronger-wooled sheep is eminently fitted to endure the hardships met with under such conditions, the skin being thicker and less inclined to sweat, the hair follicles or bulbs less susceptible to climatic effects, and the fiber stronger and hardier.

Again, the wool being strong to start with, will not so readily "go off" and become loose and open as the fine and delicate wool would, thus making it more able to withstand the ravages of the sand, dust, and sun.

At one time it was objected that strong-wooled sheep of the robust type, on being taken to the drier parts, produced wool which became coarser, in fact, which developed into hair, and it has to be admitted that there was much truth in the objection; but the nonsuccess lay in the fact that the wrong type of robust-wooled sheep was taken up to these parts, and not that the robust sheep in itself was at fault.

The failures were, generally speaking, caused by the use of rams of nondescript type without any character in their wool, whereas, what is required and

what has proved eminently successful, is the use of well-bred rams with plenty of character in the wool, which is denoted by the crimps or curls being well and evenly defined.

The argument that the extra price obtained for the finer wool justifies the keeping of fine-wooled sheep in these arid parts does not hold good, because in the first place the fine wool, being generally more wasty, will yield to the manufacturer less than the average percentage of "top" and more "noil," and as the noil is worth much less than top, it will be clear that the price obtained per pound in the grease must on that account be lessened.

Even granting that the fine wool be healthy, and with a good "tip," the small difference in value between it and the stronger wool is far more than made up by the extra weight from the stronger-wooled sheep. In fact, it can be said truthfully that the robust wool referred to fills the hand, fills the bale, and eventually fills the pocket of the careful grower.

Believing that the introduction of the strong-wooled strain already spoken of will become more common, it will be well to anticipate the alarm of some of the extra-fine-wool growers who will maintain that by the introduction of a somewhat stronger strain the repute of the far-famed Australian high-class wool will be damaged, but it should be stated that by such introduction there is no reason why the character of the wool should be in any way altered, because the fresh strain introduced should be only of the very purest. Besides, it is only reasonable to suppose that many of the fine-wooled-sheep farmers, on account of the eminently suitable conditions under which their wool is grown, will still adhere to their type of sheep, so that any fear as to this class of wool becoming extinct may be allayed. In fact, there is little doubt that the demand for such qualities of wool will always be met, for it has to be admitted that such demands are not nearly so common to-day as they were in times past, the reason being, no doubt, largely on account of the much improved machinery used in the manufacture of wool.

The following, written by "Camden," appeared in the Pastoral Review of August, 1914, page 770:

So much water has run into the sea since the days when the Australian sheepfold was divided into opposing forces on the subject of development that one can now refer to folds and wrinkles without stirring up even the mildest form of hornet's nest. And yet it is not so long ago, after all, that the subject was referred to with bated breath. Well within the last decade, those of us who moved about amongst stud flocks frequently heard ourselves remarking upon the "wonderful development" of sheep under inspection, and curiously enough that wonder was not diminished when we had to dig in among the folds and corrugations in search of indications of the true character of the wool.

In this article I have inserted two photographs which illustrate the change that has come over the scene. The photo of the wrinkly ewe was taken within the last 10 years. She was champion medium-wool housed ewe at the Sydney show, and was immensely admired by a great many sheepmen at the time. Now, I would like to ask, Does one sheepman exist at the present day who does not think that the type of sheep represented by the illustration is not over the odds? We can all admire the sheep as a triumph of breeding, but as a commercial proposition at the present day what can be said in favor of a ewe like this? In the first place, what chance would there be of growing a fleece uniform in quality and length on a skin so corrugated? In the second place, it has been found that sheep of this type burden themselves with excessive grease, which in its turn accumulates dirt, so that the animal, already handicapped, is forced to bear the additional weight of rubbish that has no commercial value. And, lastly, but by

no means least, the type represented by the photo could not be better designed as an attraction for the blowfly. The thick fleece, excessive grease, tight wrinkles combine to set up conditions extremely favorable to the operations of the maggot fly.

In order to show the contrast between a stud Merino ewe of 10 years ago and the present day, another photo is inserted in this article, and it is safe to say that as a commercial sheep it represents almost the ideal type of Merino. With sheep of this type there is a chance of maintaining, to say nothing of building up, constitution. There is also a chance of maintaining evenness of length and quality throughout the fleece. This type of sheep also carries a characteristic that adds to its value, viz, a freedom from excessive grease. The wool handles free and soft, and is less liable to accumulate dirt and rubbish. Viewing these two photos side by side throws a good deal of light upon Merino history of the last decade or so, and they tell the following story:

In the first place the early breeders started off scratch and type was fairly uniform. As the years went on and the breeders brought the results of their experience into operation they gradually divided themselves into two main bodies. One side remained fixed in its idea as to what constituted a commercial sheep and a sheep most suited to Australian conditions. It kept to the plain body and the light fleece. The other side steadily set out to improve the weight of fleece. People of this opinion also noted that the tendency of sheep run in the hot interior was to get light and fuzzy on the back, and they considered that more yolk or grease was necessary to counteract this. And so the two factions pursued their different ways, one side sticking to a plain, ordinary-looking sheep, while the other quickly developed a type that could not fail to excite the wonder and admiration even of those opposed to the type. Breeders of this school endeavored to put on weight of fleece, and they found that as they mated for density more folds and wrinkles were produced. It soon came to pass that they found their best stud sheep among the wrinkly ones, and the doctrine spread that weight of fleece could not be maintained, let alone increased, unless there was plenty of "development" in the stud sheep. The leading Merino shows helped to force this doctrine upon the public, and for years the principal prize winners at shows were the most wrinkly sheep.

The lesson that Australian sheepmen were learning was expedited and eventually brought to its crisis by the enterprise of several wealthy and prominent breeders, who imported the densely clad, heavy-yolked Vermont sheep. These sheep set an ideal before sheepmen who favored that type, and the zenith was soon reached. * * *

While all this progress was taking place those breeders who remained firm in their belief in the plain-bodied, free-wooled type of Merino increased their efforts to improve their sheep without departing from those lines. They predicted that a reaction would take place, and they made themselves ready to meet it. The pendulum swung back to the plain-bodied sheep, and in doing so gave such an impetus to the owners of the big, plain-bodied, grass-fed stud flocks that they improved their sheep out of all recognition. Take any of the big stud flocks in Riverina, western New South Wales, and South Australia to-day and it will be seen that the sheep are superior in every way to their best standard of 10 or 15 years ago. The frames have been built up into better symmetry and heavier fleeces have been put on without loading the sheep with additional grease or body wrinkles. The achievement of results in breeding is necessarily a slow process, but Merino history has been made so fast in Australia within the last 10 years that the ideal type of sheep has become universally acknowledged. Where 10 years ago there was discord on this subject there is now harmony, and all practically agree as to the ideal type.

It should also be mentioned that the most highly esteemed Australian rams have an "open" face in contrast to the heavily wooled face demanded by American breeders. Covering of wool on the legs is desired, but only as a minor point.

The type of sheep so popular for the drier, warmer sections with scattered feed might not prove to be fully adapted for our western States, but there is food for much thought in the Australian's severe criticism of wrinkles, fine wool, heavy oil, and thin skin. Aside from the influence upon wool growth of extreme warmth and dryness, it must also be granted that our winters prevent us from producing the length of wool and the uniformity in quality, appearance, and character possible under conditions occasioning no such checks. When running at liberty in paddocks, even on a light, dry soil, there is not the same amount of dirt in the fleece that is unavoidable under a system of continuous herding and several nights' use of, and daily driving to and from, a single bedding ground.

The demand of the American buyer in Australia for a light-shrinking wool has no doubt lent an added stimulus to progress in that country, but such progress even if altogether so promoted is none the less worthy of the attention of our sheep breeders and woolgrowers.

MUTTON POINTS OF AUSTRALIAN MERINOS.

Although frequent mention is made of the value of the carcass in discussions of the recently evolved Australian Merino, that sheep does not seem to be the superior of the American Merino in either size or points of mutton conformation. In both regards it is inferior to the Rambouillet as bred in the United States. The Rambouillet is little known or understood in Australia. There appears to have been some use made of an earlier type of the breed by the Peppyns, whose sheep in other hands have contributed largely to the advance of recent years.

SALES OF STUD RAMS.

Many very large and very valuable stud flocks are maintained. A few of these contain upward of 60,000 ewes, and one flock has sold as high as $260,000 worth of rams in a single season, at an average price of $30. At the 1914 annual ram sale held in Sydney, 268 Merino rams were sold, at an average price of $437, while over 2,500 other rams brought an average of $38. With a demand for flock rams in lots of 100 and more, at $20 per head, the stud sheep business is attractive to competent breeders and justifies paying two or three thousand dollars for a sire, as is commonly done. Over $7,000 has been given for single rams on several occasions. Such prices are not known in America, although breeders are not wanting whose sheep are capable of effecting an improvement upon general flocks similar

to that which gives the high values to Australian sheep. The extreme Australian prices are paid by breeders of stud sheep and are rendered possible by the patronage of a large number of owners of large commercial flocks who know that $500 or $1,000 invested in an exceptional ram is more than returned in the fleece values of the great number of sheep tracing descent to such a ram in a few years. Not only this, but improved breeding qualities of the ewes, aside from their wool yield, are highly appraised, because the owner is reasonably certain to continue in the business, market his product in a way to secure its maximum value, and control enough money for investments in connection with his business.

The type and character of sheep in many of the prominent stud flocks is so well known and the confidence in the breeders is such that a large proportion of the sales of rams for flock use and some sales of stud rams are made without examination by the buyer. Some time before the ram-selling season breeders of rams class their offerings according to quality. Rams worth $20, $30, or $40 are drafted into corresponding lots. Higher-priced rams are sold singly or upon examination at home or at public sales. Buyers of the classed flock rams state what price they wish to pay, and the number required is drawn from the lot of the price named. In some studs an outside expert is employed to class the rams to be sold. Such a classer may also divide the breeding ewes into uniform lots, for which the owner selects suitable rams.

MUTTON BREEDS.

The use and popularity of the mutton breeds in Australia is on the increase, owing to increasing demands of the meat trade and of farmers who buy sheep to fatten for the market. The president of the New South Wales Sheep Breeders' Association stated last year that in 10 or 15 years more than half the sheep of that State will be crossbreds. The term "crossbreds," as used in Australia, includes all sheep other than Merinos or those carrying a preponderance of Merino blood.

On account of the greater length and weight of wool and greater body weights when grown out, the long wools are used most for crossing by those who expect to keep the crossbred lambs until shorn. The Lincoln, Border Leicester, English Leicester, and Romney Marsh are all in demand. The Cotswold is little known. The down breeds are favored most by those who market their lambs before they are a year old, and of these breeds only the Shropshires and Southdowns can be said to be widely known.

The Corriedale is gaining ground in Australia. An organization of breeders of Corriedales was effected at Sydney in 1914, and provisions made for founding a flock book. Sixty-seven stud and flock

rams sold in the 1914 Sydney sale at an average of $42 per head. During the same week one commission firm sold sheep of various breeds at the following average prices per head: 50 Shropshire flock rams at $8; 694 Lincoln stud and flock rams and ewes at $20; 551 Border Leicesters (mainly flock rams) at $28; and 450 Romney Marsh stud and flock rams and ewes at $25.

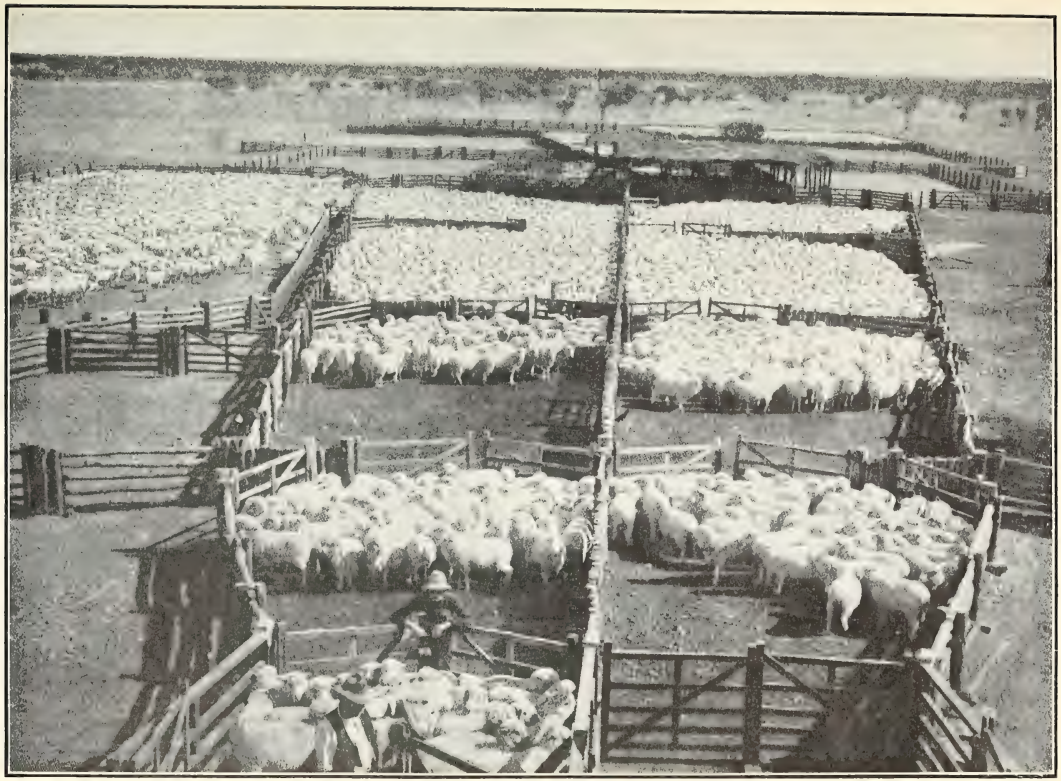
SHEEP BREEDERS' RECORDS.

While American and Australian sheep breeders seem earlier to have been in agreement as to the points of wool-producing sheep, in the last quarter of a century their ideas have diverged. In contrast to the requirements of registration and the multiplicity of flock books in the United States the great Australian Merino sheep-breeding business still progresses with only private records. These private records are in some cases fairly complete but very seldom permit the full tabulation of a pedigree for three generations. In selling rams at from $2,000 to $5,000, which is commonly done, the descent or immediate parentage is a consideration, but is vouched for only by the breeder, which is really the only guaranty received by the purchaser of any animal having its pedigree entered in an association's registry.

SHOW SHEEP.

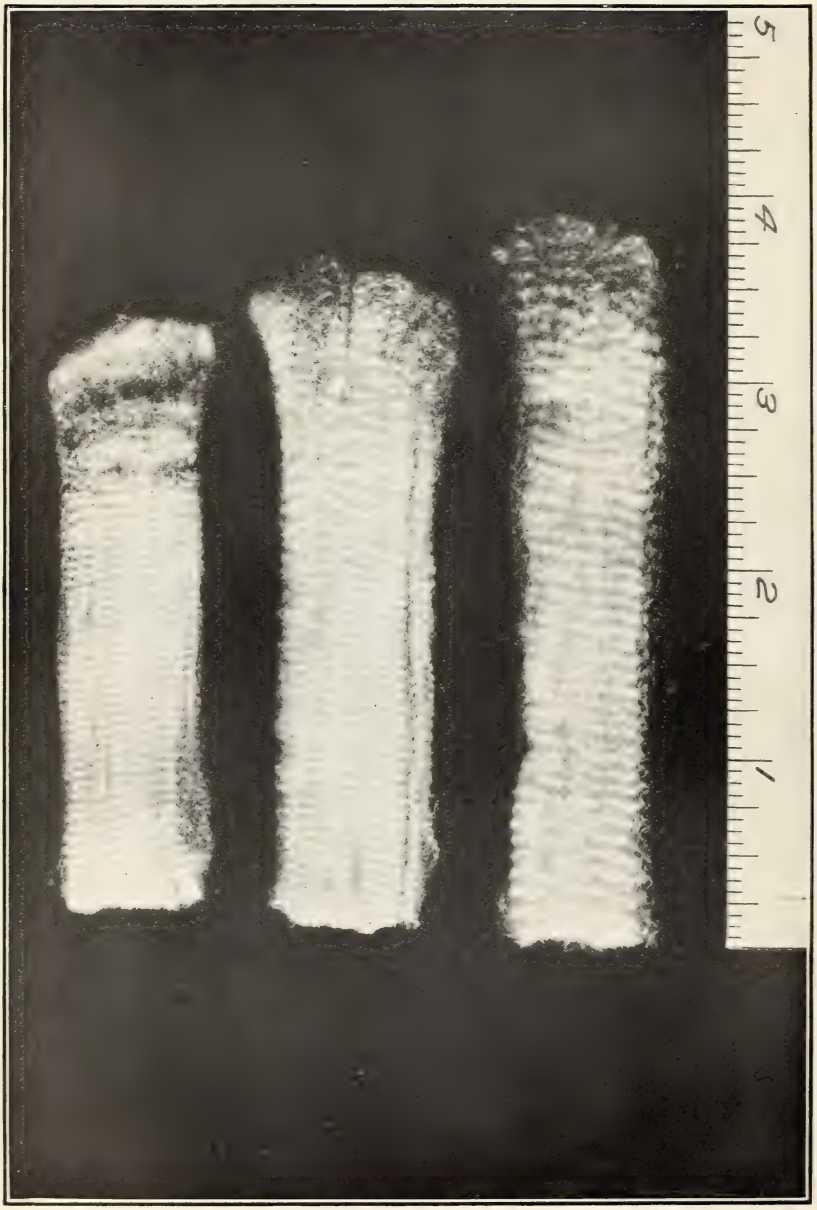
Show-ring results apparently carry little weight with Australasian sheep breeders. Their regard for a line of breeding or for any particular flock is based upon the sale of wool shorn from the offspring of representatives of such strains or flocks. Australian show managers seem to have succeeded somewhat better than those in America in having fine-wool sheep exhibited fairly. Evidences and claims of early or stubble shearing are not missing, however, and stud breeders whose flocks are well established prefer to offer their stock for sale without showing. In the Sydney annual show and sales sheep not exhibited usually sell higher than the prize winners.

Having once secured satisfactory results by using rams from a particular stud flock the commercial sheep raiser is assured that other rams from the same stud will possess and transmit the same general qualities. This is especially true in Australia because the older stud flocks make but limited, if any, use of sires bred on other stations. The American breeder's insistence upon an outcross in each generation finds its opposite in the Australian's preference for stud sires of his own breeding. Of course the size of the flocks renders it possible to avoid very close matings. In some cases carefully bred stud flocks have retained their vigor for over 20 years with practically no outside blood.



DRAFTING YARDS ON AN AUSTRALIAN STATION.

The picture shows a flat-topped canopy in the center of the yards, under which the main cutting chute is located.



REPRESENTATIVE SAMPLES OF AUSTRALIAN "FINE," "MEDIUM," AND "ROBUST" WOOL.

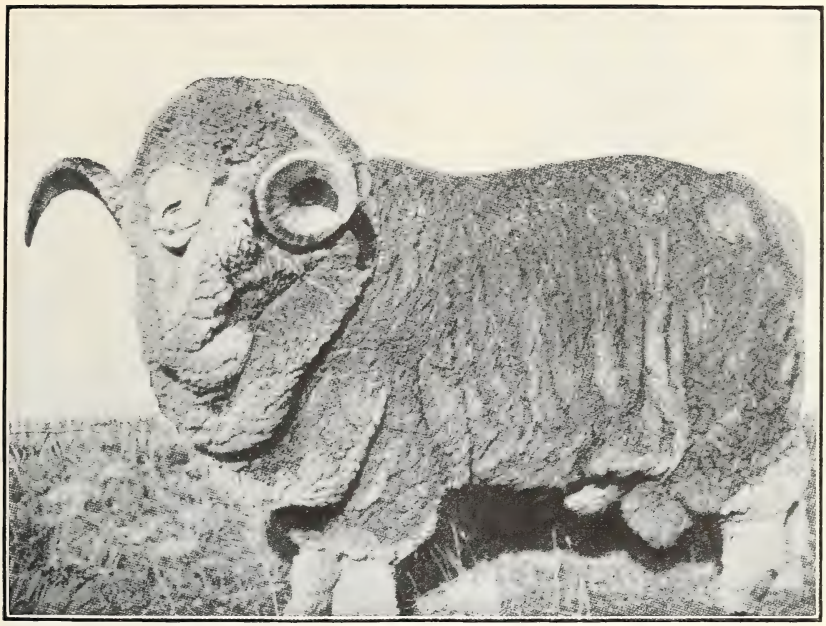


FIG. 1.—THE TYPE OF MERINO RAM LARGELY BRED IN TASMANIA.

FIG. 2.—THE TYPE OF MERINO RAM NOW POPULAR IN AUSTRALIA OUTSIDE OF TASMANIA.

FIG. 1.—A GROUP OF CORRIEDALE RAMS AT THE 1914 SHOW AT CHRISTCHURCH, NEW ZEALAND.

FIG. 2.—SHORN CORRIEDALE YEARLING RAMS.

BREEDS AND TYPES IN NEW ZEALAND.

From a total of 15,000,000 sheep in 1886, New Zealand flocks have increased steadily to 24,500,000 in 1914. A part of this increase is due to breeding for mutton, as well as wool, instead of the almost exclusive aim to produce wool before the exporting of meat became common. While wethers are still kept until 3 or 4 years of age in some sections, the number of breeding ewes is now about 12,500,000, an increase of 3,250,000 breeding ewes since 1904, during which time the total number of sheep increased by 6,000,000. The following paragraph from the New Zealand Official Year Book for 1914 explains the status of the various breeds:

The Dominion is eminently suited for sheep breeding, practically every description of sheep finding a favorable local habitat. In the hilly and down country of the South Island the Merino has been bred for very many years, and was the original sheep depastured. In fact, the Merino ewe furnished the foundation of the cross-bred stock which has made Canterbury mutton famous on British meat markets. In the early days of the Canterbury meat trade the English Leicester of the original type was the favorite ram for putting to the Merino ewe. Of later years the Lincoln has been largely employed to cross with the Merino, and black-faced rams have been further employed to put to the cross-bred ewes. In the North Island the Romney sheep, which suits the rather moist climate of this portion of the Dominion, has become the most popular sheep; it is also increasing in numbers in the South Island. The Lincoln and Border-Leicester are also favored in both islands, while the Southdown is displacing other breeds for fat-lamb production right throughout the Dominion. The Leicesters, mainly the English variety, are still the most popular British breed in the South.

With a total of 11,625,000 sheep in the South Island in April, 1914 (lambs are dropped mainly in September and October [1]), there were 85,299 breeding ewes in 491 registered flocks, distributed as follows:

Breed.	Number of flocks.	Ewes bred in 1914.	Breed.	Number of flocks.	Ewes bred in 1914.
Border Leicester	158	19,910	Corriedale	22	11,010
English Leicester	113	17,937	Merino	15	7,399
Romney Marsh	85	15,110	Lincoln	14	1,861
Southdown	46	4,989	Ryeland	3	159
Shropshire	34	3,525	Half-bred	1	3,399

THE CORRIEDALE.

The study of Corriedale sheep and the selection of a trial importation were the main objects of the writer's visit to New Zealand. The Corriedale breed was produced and is still most extensively bred in the Province of Canterbury of the South Island of New Zealand.

The Corriedale sheep, as now bred in New Zealand, is a wool and mutton sheep. Its breeders seem to have given special emphasis to wool, most of which would grade on our market as three-eighths blood and commonly has a length of 6 inches. At the Christchurch

[1] Corresponding to March and April in the Northern Hemisphere.

show prizes are offered for Corriedale sheep entered in the wool and mutton competition. The following rules govern this competition:

For the purpose of this competition the definition of Corriedale to be as follows:

To be the progeny of half-bred rams from half-bred ewes, and the result of not less than 15 years of in-breeding, and showing a decided fixed type of half-bred sheep, the original stock to be the progeny of Merino and long-wool sheep of any pure breed.

The breeding of the rams to be stated at time of entry.

Each exhibitor will be required to enter three Corriedale ram hoggets; all rams to be bred by exhibitor.

The rams will be taken charge of by the committee, shorn and grazed as the committee may deem desirable, but at the owner's risk. The rams will again be exhibited at the association's show the following year; they will be shorn by the committee, the fleeces being carefully weighed and afterwards valued in the grease by an expert.

The shorn rams will be judged by fat-sheep judges, who will be asked to fix the value of the sheep from a mutton point of view.

The ram showing the greatest money value, carcass and wool taken into consideration, to be the winner.

The following tabulation of the results of the 1914 competition shows the weights and quality of the fleeces and the carcass values:

Corriedale wool and mutton competition, 1914.

Ear tag.	Weight of fleece.	Weight of pieces.	Total weight of wool.	Value per pound, fleece.	Value per pound, pieces.	Value of fleece.	Value of pieces.	Total value of wool.	Wool valuer's remarks.	Value of mutton.	Total value.
	lb. oz.	*lb. oz.*	*lb. oz.*								
2..	12 11	3 5	16 0	$0.26½	$0.15½	$3.56	$0.51	$3.87	48s.....	$6.60	$10.47
8..	12 10	4 1	16 11	.27	.16	3.41	.65	4.06	50s.....	6.36	10.42
6..	11 3	3 1	14 4	.26	.15½	2.91	.47	3.38	48s.....	6.96	10.34
15..	15 2	5 12	20 14	.25½	.15½	3.86	.99	4.75	50s, 56s..	5.52	10.27
1..	10 2	4 1	14 3	.27	.15½	2.73	.63	3.36	48s, 50s..	6.84	10.20
3..	13 1	4 5	17 6	.27	.15½	3.53	.67	4.20	46s.....	6.00	10.20
16..	12 1	4 9	16 10	.26½	.16½	3.20	.75	3.95	56s.....	6.00	9.95
4..	14 6	3 3	17 9	.27	.15½	3.88	.49	4.38	46s.....	5.52	9.90
14..	12 5	3 9	15 14	.26	.16	3.20	.57	3.77	50s.....	6.00	9.89
18..	12 10	5 4	17 14	.26½	.16½	3.35	.87	4.21	50s.....	5.64	9.85
17..	11 8	5 4	16 12	.27	.16½	3.10	.87	3.97	50s.....	5.82	9.79
11..	12 2	3 14	16 0	.27	.16	3.27	.62	3.89	50s good.	5.88	9.77
13..	11 8	4 12	16 4	.27	.16	3.10	.78	3.86	50s, 56s..	5.76	9.62
7..	11 13	3 4	15 1	.25	.15½	2.95	.50	3.46	46s, 50s..	6.12	9.58
5..	12 7	3 2	15 9	.27	.16	3.36	.50	3.85	50s.....	5.64	9.50
9..	12 11	3 8	16 3	.27½	.16	3.49	.56	4.05	50s, 56s..	5.40	9.45
10..	10 15	4 4	15 3	.26	.16	2.84	.68	3.52	50s.....	5.88	9.40
12..	11 2	3 14	15 0	.25½	.16	2.84	.62	3.46	50s.....	5.04	8.50

The illustrations give a fair idea of the general appearance of Corriedale sheep, though not many representatives have the carcass development of those shown with their fleeces removed. On the average the carcasses have much the same development as is shown by lambs from Merino ewes and sired by rams of the long-wool breeds in this country. A good many lambs of Corriedale breeding are marketed around six months of age and shipped with first-cross lambs as "Prime Canterbury." Old or cast Corriedale ewes are commonly bred to mutton rams to produce carcasses of higher value, the ewes themselves then being fattened and sold.

The development of the Corriedale started with the crossing of Lincoln and English Leicester rams upon Merino ewes to produce lamb carcasses for export. Finding that ewes of such breeding were profitable in some sections, attempts were made to create flocks that would breed true to the type shown by the half-bred of the first cross. Half-bred rams were mated with half-bred ewes, the ewe progeny very severely culled (sometimes only 25 per cent were retained) and again mated to selected half-bred rams, usually of the same generation and also from the same flock. This continued inbreeding of half-breds, accompanied by careful and strong culling, has produced a class of sheep, which, as has been said, compare favorably with other breeds in respect to uniformity and trueness to type, as shown by evenness in separate flocks or similarity of different flocks.

The following flock histories printed in the appendix of volume VII of the South Island Flock Book, published by the council of the New Zealand Sheep Breeders' Association, relates the essential features in connection with three of the 17 Corriedale flocks entered in that volume:

CORRIEDALE FLOCK. THE PROPERTY OF JAMES LITTLE.

Mr. Little commenced experimenting with the view of producing inbred half-bred sheep when he was manager for the late Dr. Webster, proprietor of the Corriedale estate, Otago. Romney Marsh and Merinos were first used. The result was entirely satisfactory and would have been continued but for the decease of that gentleman and the sale of the property. On his taking up the Allendale estate, Waikari, Mr. Little continued to experiment.

In 1879–1880 he put 4,000 large-framed high-class Merino ewes to Lincoln rams, bred by Mr. Sutton and some of the late Dr. Webster's strain. From 100 of the best ram lambs, the progeny of these ewes, a heavy cull was made, when 20 of the best were retained for service. These were mated with a pick of the half-bred ewes, the progeny of the Merino ewes and Sutton and Webster rams, the result being a very high-class type of half-bred sheep. In 1890 two rams bred by Mr. Tanner from Merino ewes and Lincoln rams were used, but the result was not considered satisfactory. About the same time 20 stud Merino ewes were purchased from Mr. D. Rutherford and the same number from the Horsley Downs flock. By this means fresh blood was procured and was kept going on the line breeding until 1902, when a Corriedale ram was procured from Mr. James Stringfellow. In 1909 a ram was used bred by the New Zealand and Australian Land Co. (Moeraki estate). The rams used in the flock, with these exceptions, have all been descended from "Old Jonathan," bred by Mr. Little 20 years ago.

In 1903 the flock was transferred from Allendale to Dalmeny.

Returns for 1911.

Ewes, four-tooth and upwards, put to ram	598
Shearling ewes put to ram	260
Total	858

Lambs bred in 1910—Rams, 421; ewes, 483.
Sires used in 1911, bred by owner.
Rams sold—Two-tooth, 131.

CORRIEDALE FLOCK. THE PROPERTY OF THE NEW ZEALAND AND AUSTRALIA LAND CO. (LTD.)

This flock was founded by Mr. W. S. Davidson, at the New Zealand and Australian Land Co.'s Levels Estate, in 1874. One thousand Merino ewes were put to Lincoln rams, and out of the produce of these ewes 150 half-bred ewes were selected for mating with rams, also out of the same ewes.

Since 1874 the progeny of these ewes have been inbred with rams out of the same flock. The only outside blood introduced was a ram bought in 1892 from Mr. Tanner, Hawke's Bay (who had then an inbred flock started about the same time as the Levels Estate flock), and one ram from Messrs. Reid Bros., Darfield, in 1902, but these two rams were very slightly used. In 1904, when the New Zealand and Australian Land Co. gave up the Levels Estate for closer settlement, some of the Levels Estate Corriedale flock was transferred to the New Zealand and Australian Land Co.'s Moeraki Estate at Hampden, where its breeding has been continued on the same lines as in previous years, and no outside blood has been introduced into the flock since it was transferred to that property.

Returns for 1911.

Ewes, four-tooth and over, put to ram	391
Shearing ewes from own flock put to ram	500
Total	502

Lambs bred in 1910—Rams, 231; ewes, 257.
Sires used in 1911, bred by owner.
Rams sold—Two-tooth, 223; four-tooth, 4.

CORRIEDALE FLOCK. THE PROPERTY OF C. H. ENSOR.

This flock was founded by the late Charles Ensor, of Mount Grey, in the year 1889, by mating fine-combing stud Merino ewes with English Leicester stud rams. The progeny were then inbred for a number of years, the only outside blood used being rams from the New Zealand and Australian Land Co.'s (Levels) Corriedale flock, and later from the same flock but bred on the company's Moeraki Estate. The leading sires have been bred in the flock.

In 1901 the flock passed into the hands of Ensor Bros., who continued to carry on the flock and to follow the lines of breeding of the founder.

In 1906 and the following year nearly the whole flock became the property of C. H. Ensor. It was then removed to Mount Grey, White Rock.

Returns for 1911.

Ewes, four-tooth and over, put to ram	2,100
Shearling ewes from own flock put to ram	500
Total	2,600

Lambs bred in 1910—Rams, 1,080; ewes, 1,150.
Sires used in 1911, "Quality," "Premier 4th," "Model," "Jimmy," and others bred by owner; "Samson," bred by New Zealand and Australian Land Co.; others bred by G. D. Greenwood and C. N. Orbell.
Rams sold—Two-tooth, 419; four-tooth, 20.

As to the Merino's share in forming the Corriedale there need be no question. It would be impossible to state accurately whether the breed is indebted most to the English Leicester or to the Lincoln. The question is not of great moment, since the Lincoln was itself improved by the English Leicester at one time. In the English

FIG. 1.—A GROUP OF MERINO RAMS FROM ONE FLOCK SOLD BY AUCTION AT SYDNEY IN JULY, 1914, AT AN AVERAGE OF $1,770, THE RAM ON THE RIGHT BRINGING $5,000.

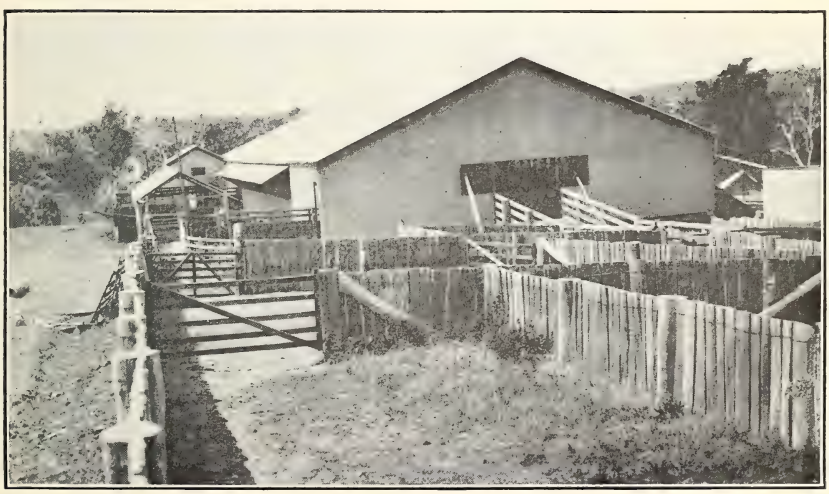
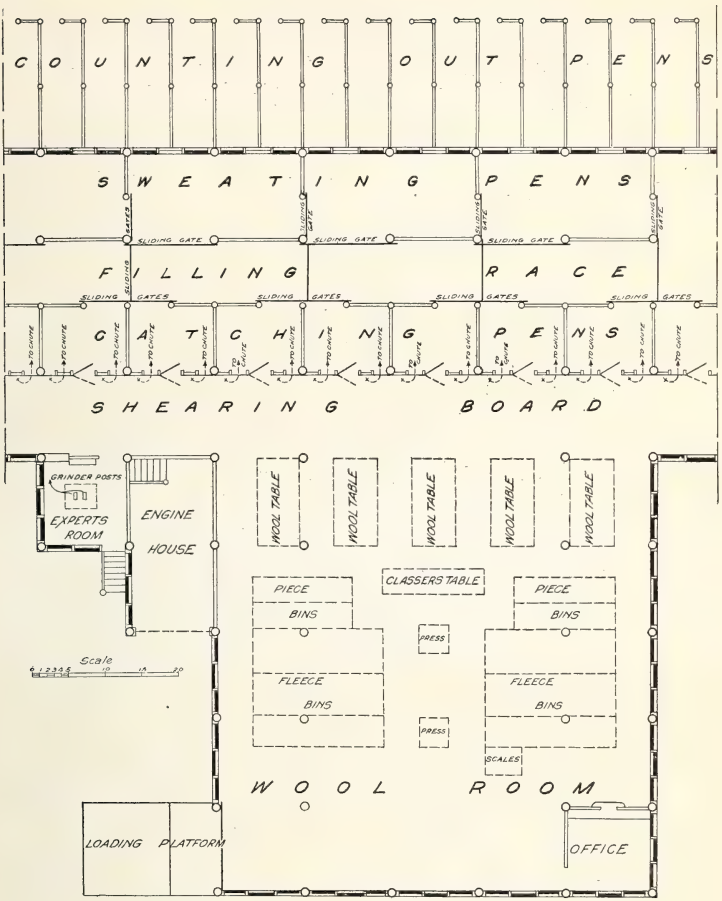


FIG. 2.—A QUEENSLAND SHEARING SHED THAT TURNS OUT ONE OF THE HIGHEST SELLING CLIPS IN THAT STATE.

FIG. 1.—WOOL ROOM OF A NEW SOUTH WALES SHEARING SHED.

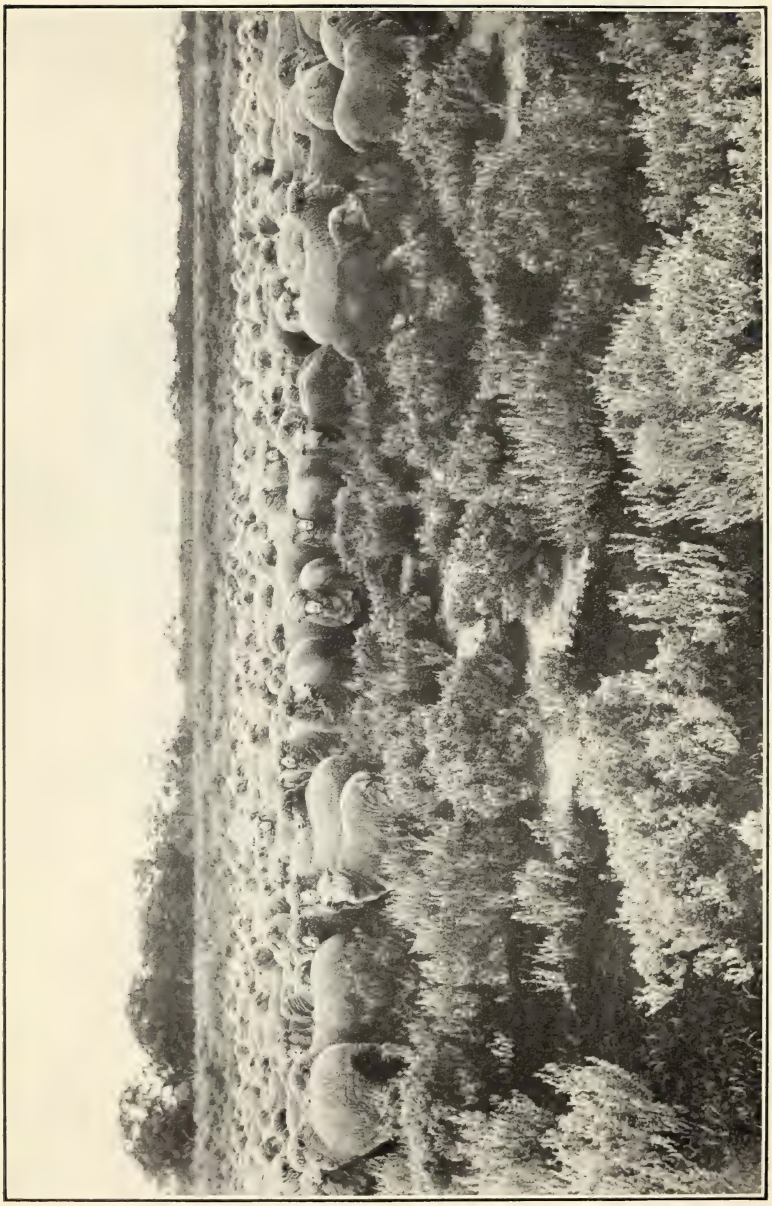
FIG. 2.—BALING ROOM IN AN AUSTRALIAN SHEARING SHED.

An end of the classer's table shows in the space between the wool bins at the left.



PLAN OF WOOL ROOM AND SECTION OF SHEARING BOARD OF AN AUSTRALIAN SHEARING SHED.

The sweating pens, filling race, and catching pens are built sufficiently high from the ground to permit shorn sheep discharged through the schutes to pass underneath to the counting pens, which are outside the building.



NEW SOUTH WALES MERINO EWES AND LAMBS.

Leicester and Merino are two breeds less mixed in their earlier ancestries and bred for their particular improved qualities for a longer time than any other breeds of sheep. Flocks containing all three lines of blood compare favorably with those containing only two, though breeders whose sheep have none of the Leicester blood claim heavier shearing qualities and greater vitality, to which latter claim objections are not wanting.

Even among New Zealand breeders of Corriedales there is strong preference for the "stronger" wools, the reason assigned being practically the same as those quoted from Australian Merino breeders in an earlier part of this report.

The character of country upon which the Corriedale is bred in New Zealand varies from level and fairly rich artificial grass pastures to rough hills with altitudes around 3,000 feet, on which snow sometimes lies for several months at a time. At its worst the feed is better than that produced on many of the dry-range areas of the United States. The breed's greatest promise of usefulness in this country is for those localities which need and which can support sheep of more carcass development than the Merino has, and in which the wool is to be relied upon for at least one-half of the flock income. Owing to the paddock system of grazing sheep in New Zealand, selection has not regarded the herding instinct that ordinarily shows in sheep having one-half Merino blood. The experiments which the Bureau of Animal Industry will conduct with this breed will be designed to test the herding instinct of the breed, its ability to thrive on various types of western ranges, and the extent to which it can impress its features upon the sheep bred in the sections where it seems desirable to raise a sheep such as the Corriedale now is.

SHEARING AND WOOL CLASSING.

The practices of American and Australasian woolgrowers differ more in respect to the handling of the shorn wool than in any other part of their work. In the United States the wool is not infrequently sold before it is shorn. Even when it is to be sold after shearing the sheep are not sorted for shearing and the entire fleeces are sacked just as they run. In disposing of the wool there is no possibility of fixing a price upon the amount of each of the various classes of wool in the sacks, but bargaining must be done upon the basis of the clip as a whole. The clips are usually sold to traveling representatives of houses located near the manufacturing centers. Manufacturers may send their buyers to buy direct from the woolgrowers, but most of the concerns buying in the field assemble numerous clips and sell to mills in large lots from their warehouses. While in the dealers' hands many, and in some years most, of the clips are opened

up and the fleeces, without being untied, are graded and placed in large piles awaiting sale.

Practically all of the Australian and New Zealand wool remains the property of the grower until it is sold to the manufacturer. The cost of actually shearing the sheep constitutes only about one-half of the amount expended in preparing the wool. The main result of this extra labor and trouble is to divide the clip into various lots, each of which is so uniform within itself that the buyer knows by examination of a single bale whether or not the lot is of the grade and quality of wool he needs, and is also sure that there will be in a lot purchased a minimum amount of wool differing from what the lot was supposed mainly to consist of. This gives certainty to the transaction and renders possible the Australasian system of selling wool through commission brokers to mill buyers. Independent operators may buy wool to sell again, but the bulk of the offerings go direct from the warehouses of the selling agents to the mills. As a result of this plan the report of sales received by a grower shows the selling price of each of the lines into which the classer divided the clip.

In view of the present interest in this country in improving the preparation of wools for market, it may be of advantage to discuss the more distinctive features of the Australasian system.

It is not yet time in this discussion to consider the practicability of having American wools classed as are Australian wools, or the probability of the growers' profiting thereby in the event of their becoming convinced that they can and should adopt the essential features of the Australian method of handling wool at the shearing shed.

RELATION OF WOOL CLASSING TO BREEDING.

The part that wool classing plays in promoting better breeding is of great importance. This phase of the matter is well expressed by a contribution to the Pastoral Review of January, 1915, page 135:

> The classification of his wool at shearing time is the woolgrower's annual indication of the progress he is making as a breeder, for it shows him whether he is increasing the proportion of the higher qualities of wool and at the same time decreasing the proportion of the lower grades, and whether he is thus making his flock more profitable. If, therefore, the Australian woolgrower abandoned the classing of his clip he might just as well abandon all the other little points in sheep management the observance of which has done so much to place the wool industry where it is.
>
> He has spent huge sums of money on the best class of rams he can afford, on subdivision, and other improvements that are necessary for improving his sheep by selection, and he has done this so that year by year he will see his proportion of high-grade wools increase and his proportion of low-grade wools decrease. Is it likely, then, that at shearing time he will jumble all his fleeces up into a confused heap and bury beneath locks, stained pieces, necks, burry breeches, and bellies all the beautiful, clean, shafty wool he has managed to grow on the back and sides of his sheep?

Experience tells them whether fine, medium, or robust wool stands their particular climatic conditions best, and experience also tells them the most profitable limit as regards length of staple. Having the right type of wool fixed in their eye, the Australian sheepmen, by the process of selection, endeavor to get as much of that type of wool as they can throughout their entire flocks. By care and skill, exercised for many years, a large number of breeders have brought their flocks to a wonderful standard of uniformity. * * *

THE WOOL FROM THE SHEEP TO THE BALE.

An idea of what is required in preparing wool to secure the advantage of full preparation can best be gained by following a clip from the shearing shed to its final sale.

The sheep come to the shearing shed in uniform bands. Longwool and crossbred sheep never run together, neither is either type mixed with Merino sheep. With mature sheep it is unnecessary to sort immediately before shearing except to separate lambs or a few strays. Young sheep are carefully classed before their first shearing and remain in the same uniform lots during their stay on the station. This uniformity in the single lot of sheep does not mean that all the fleeces go into one class. It means that the classer will have to deal at one time only with fleeces of the same general type and that by examining the sheep and studying the first few fleeces brought up he can determine how the wool should be divided up to bring the greatest total returns when sold.

Great care is exercised to keep the wool in good condition. At one Queensland shearing shed the ground from the approach to the pens to the shed door is sprinkled with water to prevent dust from rising and settling upon the sheep. The holding pens all have slatted floors so that even if the sheep lie down no dirt adheres and the wool is not soiled.

The shearer first removes the belly wool, separating it as a single piece from the fleece, when it is carried to the bin provided for "bellies" near the baler. When the rest of the fleece is removed it is picked up by a boy who carries it to a slatted-topped table in the wool room, and while retaining his hold upon the thigh wool, throws the fleece into the air and away from him in such a way that it falls upon the table fully spread out, flesh side down, as shown in Plate VI.

SKIRTING AND ROLLING.

The fleece is now skirted. Two men, one on each side of the table, remove the tags, "britch" wool, and discolored, sandy, or burry wool from the lower sides and as much as may be necessary from the neck. In some well-bred sheep it may not be necessary to go very deeply into the britch. While the skirters must use their judgment for each fleece as to how much to remove, either from the thigh, side or neck, their work is directed and supervised by the wool classer, who has charge of the wool after it reaches the wool room.

After skirting, each man turns his side of the fleece in toward the center and one turns back the neck end while the other turns the other end in toward the neck end. The fleece is then rolled up from the breech forward, making it into a neat bundle, which is then carried to the classer's table.

PIECE PICKING.

Before discussing the work at the classer's table, it will be best to follow the skirtings further. The wool dropped to the floor by the skirters is carried to the table of the piece picker. Ordinarily the piece picker makes three lots from what comes to his table—stained wool; first pieces, which consist of the lightest and cleanest pieces; and the inferior or second pieces. These three kinds of pieces are taken to corresponding bins convenient to the baler. If heavy dung locks are present they are thrown into a pile at one side until the wool can be clipped off during odd times or on wet days. In some cases, when it is necessary to remove considerable burry wool from the neck, this goes to the bin for broken fleeces and may also first have some pieces removed from it. The floor sweepings go over the piece picker's table. The bellies commonly go direct to their bin in the baling room, though preferably the discolored wool is taken out as stained pieces, particularly in handling wethers' wool. The second cuts, sweat locks, etc., that fall through the wool tables are baled as locks. The number of bales of bellies, pieces, and locks resulting from this work averages around one-third of the total number in the clip. It is claimed in some cases that the extra value received for pieces by having them assorted is sufficient to pay for the labor of the wool room.

WOOL CLASSING.

Most interesting, though perhaps not always most important, of all, is the work of the classer or grader, as he would be known in a United States warehouse. His table is located convenient to the bins from which the balers take the wool, and faces in such a way as to give him a view of the work at the tables. He directs and is responsible for the work of the skirters and rollers, piece pickers, and balers. He receives the rolled fleeces at his own table and must assign each to its proper class. The number of classers and their designation depend upon the size and character of the clip. It is regarded as always desirable that the best lot should be the largest and that as few classes as possible should be made. At the same time a fleece that is tender or otherwise inferior is never placed with better fleeces to avoid making another class, as its presence would destroy the buyer's confidence in the classing of the whole clip.

This point is presented by a large wool-selling commission house in the following suggestions:

Avoid overclassing, and, consistently with evenness, length, condition, and quality, make the lines as large as possible. The best average prices for the whole clip are usually secured when the biggest line brings the biggest price.

Our recommendation is to skirt lightly and make the top lines of the fleece as large as possible, so as to get the best average price for the whole of the clip, which, after all, is the true index of the value realized for the wool.

Another Australian authority says:

A system of classing which applies generally to Merino clips * * * consists in classing—

(*a*) According to the length and strength of the staple.

(*b*) The "condition" of the wool, i. e., the amount of yolk or grease, and the quality of earth or sand and vegetable matter (such as burrs, seeds, etc.) in the fleece.

(*c*) Color and general characteristics of the wool.

Regarding classing crossbred wool the same authority says:

It is in consequence of this variation (from 36's to 56's in fineness) that it is necessary in classing crossbred to take so largely into account the fineness or coarseness of fiber, but at the same time condition, color, and the general appearance of the wool must not be forgotten.

The classing of the 1913 clip from a New South Wales flock of 7,000 head composed of ewes, hoggets (yearling ewes), and rams is shown. It possibly represents overclassing, though it was considered imperative to keep rams', ewes', and yearlings' wool separate.

Classing of the 1913 clip from a flock of 7,000 head.

Brand.[1]	Number of bales.	Description of wool.	Price per pound at which sold.
			Cents.
A comb. E	17	Bright, clean wool with good length and character	21
A comb. EH	4	do	22
A comb. R	3	do	20
AA comb. E	29	Second to A comb. E; shorter with more condition	20
AA comb. EH	5	Second to A comb. EH; shorter with more condition	18
AA comb. R	1	Second to A comb. R; shorter with more condition	16
A fleece E	8	Bright, with good length, but tender	18
A fleece EH	2	do	18
S comb	4	All strong fleeces	20
Fleece E	6	Short and heavy conditioned fleeces (yellow)	17
Fleece EH	2	do	17
Fleece R	2	do	16½
Broken E	21	Necks and bulky pieces with very little burr and seed	18½
Broken EH	5	do	21
Broken R	2	do	20
A pieces E	29	Second to broken E and heavy with burr and seed	20
A pieces EH	9	Second to broken EH and heavy with burr and seed	17
A pieces R	4	Second to broken R and heavy with burr and seed	14½
Bellies E	7		13
Bellies EH	2		13
Bellies R	1		11
Stained pieces	1		8
Locks E	6		6
Locks EH	2		6
Locks R	1		5
A lambs	1	Best of lambs, good length with very light burr	19
AA lambs	5	Shorter than A lambs, with a little burr and seed	11½
AAA lambs	6	Very short and heavy with burr and seed	7

[1] E=Ewes. EH=Ewe hoggets. R=Rams..

At a Queensland shed, where 10,000 2-year-old wethers were shorn, the following classes were made:

1. AAA combing. This lot contained only the finer, best fleeces, having good length, sound, bright, and light shrinking.

2. AA combing. Similar to AAA combing, but heavier in tips, and would shrink more on that account.

3. AA. Similar to AA combing, but shorter.

4. A. Short-stapled and heavy in yolk.

5. AA fleece. Rougher and coarser than AA combing.

6. A fleece. Short, discolored.

7. Broken fleeces. Best parts of neck and britch wool from skirtings.

8. First pieces. Best and cleanest of skirtings that remain after separation of that going into broken fleeces.

9. Pieces. Sometimes called second pieces; dirtier and inferior to first pieces.

10. Locks. Second cuts and sweaty locks from below the wool table.

11. Bellies.

The wool bales are branded with the classer's designation of their contents and so entered in the auction-sale catalogue. It will be noticed in the latter case that the best wool was called AAA combing, and AA combing was not so good. In the New South Wales clip referred to the A grade is higher than AA. This causes no confusion, because the buyer depends for his estimate upon his examination of sample bales, and his chief concern in regard to the classing is to know that the skirting was properly done, and that there is uniformity throughout each bale and throughout the various bales in the lot as offered in the sale.

It is the aim to avoid, as far as possible, the selling of too many lots of less than 10 bales. As a rule a 50-bale lot will bring more per pound than a 5 or 10 bale lot of similar wool. It takes the buyer as long to value a small lot as a large one, and, if purchased, the smaller lot only partially fills an order for several hundred bales.

A lot of three bales or less is sold as a "star" lot, either at a different time or in a different place from the selling of the large lots. Selling houses sometimes "interlot" what would otherwise be star lots. Small lots of wools of the same kind and considered to have the same money value are combined to form a larger lot, and settlement with each consignor interested in the joint offering is made at the price realized for the interlotted offering.

Report of a wool sale at Sydney in April, 1914.

Lot.	Mark.	Description.	Bales.	Price.
	GREASY.			*d.*
1	H/Nandawar (from Boggabri)	Lbs	12	6½
2	Lumley Park/C (from Goulburn)	X-B Lbs	9	10¾
3	Tabratong (from Nevertire)	Pcs	16	2¾
4	LJH/NZL (from Braidwood)	MW	6	9½
5	⌒/Jh/New England (from Inverell)	F	5	11½
6	Tyrie (from Dandaloo)	Pcs	14	3
7	E/Lora Downs (from Coonamble)	AAE	10	.....
8	Willara (from Wanaaring)	F	8	9
	No lot 9.			
10	DD/Lisgar (from Parkes)	1 E and H	25	.....
11	.....do	1 W	9	.....
12	.....do	1 Pcs	10	9½
13	DP (from Monaro)	E and H	6	9¼
14	+/a/Kentucky (from Queanbeyan)	E and W	7	10½
15	JP/Marysvale (from Goulburn)	M	14	11¼

Report of a wool sale at Sydney in April, 1914—Continued.

Lot.	Mark.	Description.	Bales.	Price.
	GREASY—continued.			d.
16	JP/Marysvale (from Goulburn)	M	7	10¾
17	WJM (from Goulburn)	ME	6	.....
18	MD/Hill/Station in oval (from Queanbeyan)	1 Com E	18	11½
19	.....do	A Com E	9	10¾
20	.....do	F	6	9¼
21	Auburn Vale/Ans (from Inverell)	Lbs	12	8¾
22	Euambeline (from Nyngan)	AA Lbs	6	7¾
23	.....do	A Lbs	7	5
24	JMD/Uriarra (from Queanbeyan)	BE	7	10¼
25	.....do	X-B and X-B E	6	9¾
26	Ahn in dia./Cooyah (from Springsure, Q.)	AAAW	7	13
27	.....do	AAAE	11	12¼
28	.....do	AAW	9	11½
29	.....do	AAE	11	11¾
30	.....do	AA Pcs E & W	11	10¾
31	.....do	AA Lbs	8	11½
32	Bayrick (from Augathella, Q.)	AAH	22	11¾
33	.....do	AH	7	10½
34	.....do	AE	30	10½
35	.....do	1 Pcs H	20	11
36	.....do	Pcs E	23	9¼
37	AM/Blairgowrie (from Jericho, Q.)	A Pcs E	11	8¾
38	CM/Derribong (from Dandaloo)	A Crs	11	3
39	ABT/Wirchilleba (from Cobar)	1 Pcs E	11	8
40	ABT/Wirchilleba	2 Pcs E	12	5¾
41	.....do	Locks E	6	3½
42	HPG/Mugrugulla (from Brewarrina)	AAE	13	10¼
43	.....do	AAXH	8	11¼
	No lots 44 to 48.			
	SCOURED.			
49	Collewaroy	1 Pcs	9	15½
50	Rockview/Collingwood	Super F	19	22¾
51	.....do	F	13	21
52	Bos/Q	Locks	10	.....
	No lots 53 to 65.			
66	RRR	M Lks	1	9
67	.....do	X-B Locks	1	9½
68	Collewaroy	S Pcs	2	12¼
69	Rockview/Collingwood	Pcs	2	16¼
70	AM/Blairgowrie	Bls	4	13¾
71	.....do	Std Pcs	2	10¾
72	.....do	Bls and Lks	1	9½
73	.....do	Locks	2	9½
74	.....do	Locks	1	9
75	ER	Pcs	1	12½
	No lots 76 to 199. GREASY.			
200	AB/WIN	Pcs	2	3
201	.....do	Locks	1	1¾
202	H/Nandawar	Pcs	1	3½
203	.....do	Bls	1	.....
	No lot 204.			
205	WC/Moonan	F and Clips	1	8
206	EJ/Mt. Vale	E	1	9½
207	HMC/W	F	1	9
208	CH/Rosehill	F	5	8¼
209	.....do	Pcs	1	7
210	.....do	Locks	1	3½
211	WGD/Glendower	Lambs	1	.....
212	Avery/Alroy	CH	4	4½
213	.....do	FL and CH	1	5½
214	JK/J/Hollymount	W	2	11
214a	.....do	E	1	10
	No lot 215.			
	No lot 216.			
217	Springvale/JRH	Lambs	2	7¾
218	Lumley Park/C	X-B Lbs X-B F and MF	1	9½
219	.....do	X-B Lbs & 2 X-B Lbs	1	8¼
220	JRC/O	F	2	9½
221	.....do	X-B	1	8
222	JRRC/O	F	1	10
223	DC/Highfield	EW and H	3	11½
	No lot 224.			
225	⌒/Jh/New England	Bls and F	1	7
226	.....do	Locks and Pcs	1	5¼
227	.....do	F & M & X-B	2	10¾
228	.....do	X-B	1	9¾

NOTE.—The prices are given in English pence; 1 penny equals 2 cents.

The sellers made the following comments on some of the lots:

Lot 2. X-bred lambs 21½ cents. Good quality and staple, dry, dusty.

Lot 5. F 23 cents. Fine, good staple and condition, some burr.

Lot 14. Fleece 20½ cents. Fair staple and condition, skirty.

Lots 18 and 19. 1st Com. 23 cents, A Com. 21½ cents. Fine, soft, good staple, fairly good condition.

Lots 26 to 30. AAAW 26 cents, AAAE 24½ cents, AAE 23½ cents, Pcs. 21½ cents, lambs 23 cents. Fine, soft, well grown, good color and condition.

Lots 32, 34, and 35. AAH 23½ cents, AE 21 cents, 1st Pcs. 22 cents. Good quality and condition, fair staple.

Lot 42. AAE 20½ cents, AAXH 22½ cents. Fine, fair staple, dusty tip.

EXPENSE OF PREPARING WOOL FOR MARKET.

Australian wages for shearing flock wethers, ewes, and lambs are 6 cents per head, with no rations furnished. Wool skirters and rollers, balers, piece pickers and fleece carriers receive $10.75 per week, without rations. Other shed hands are paid $8.25 or $10 per week (without rations), depending upon whether they are under or over 18 years of age. The most common wage for the classer is $5 per 1,000 sheep shorn. It is considered that 16 men should do the work in a wool room for from 36 to 40 shearers. These are, 1 classer, 6 wool rollers, 4 piece pickers, 1 lock and belly picker, 3 wool pressers, and 1 man to weigh and brand the bales. In addition to this number, boys are needed to sweep the floor and carry fleeces, their number depending largely upon the arrangement of the shed. In one shed visited 12 boys were sweeping and carrying fleeces for 35 shearers, and the total number of employees other than shearers was 38. This shed was not well arranged, the wool was very burry, and the broken fleece wool was passed over the piece pickers' table.

At another New South Wales shearing shed the owner stated that when running with 36 shearers, 24 men and a classer cared for the wool until it was delivered in branded bales. The arrangements in this case reduced the distance for carrying wool but the greatest saving was in the elimination of the piece picking tables and the necessity of gathering skirtings from the floor and carrying them to the tables. The tables were of extra size with four men stationed at each. Each man skirted always from the same part of the fleece and threw the wool into corresponding bins near at hand.

In Australia considerable numbers of sheep are shorn by individuals or companies working on contracts. The sheep owner may or may not furnish the shearing machinery and he may employ his own classer, who then takes charge of the contractor's hands who work in the wool room. In one shed visited, where shearing was done by contract, the owner delivered the sheep at the shed and furnished fuel and quarters for the hands and engaged and paid the classer. The contractor furnished the machinery, sheared the sheep, put up

the wool, and delivered the bales at a charge of 12 cents per sheep, incurring the risk of loss through having to pay wages to shed hands when sheep were too wet for shearing.

SELLING GRADED OR CLASSED WOOLS IN THE UNITED STATES.

The terms "grading" and "classing" have of late come to have distinctive meanings. Grading wool is understood to consist of assigning whole fleeces to different lots according to length and fineness of fiber. Classing is understood to comprise all that grading does, but in addition each fleece is skirted. Fleeces that would go into one grade may, in classing, be made into two or more lots, according to shrinkage, strength, or character. Classing is an elaboration of the principle of grading. It effects a greater uniformity and allows a closer appraisal for each lot of wool. It also entails more labor, and when carried too far, especially with small clips, produces a larger number of small lots than is desirable.

There can be no doubt of the desirability from the wool grower's standpoint of having his wool clip sold in as many separate parts as are necessary to separate the main general classes of wool contained. How far this division, classing, or grading of a clip should be carried depends upon the amount and kinds of wools it contains and upon the selling arrangements.

After many years of classing his clip, the Australian is firmly convinced that he realizes more for his wool by selling it in such number of distinct lots that a manufacturer can find in a single lot just the kind of wool he needs for a particular fabric and can buy that wool alone without having to include in his purchase some wool that he does not want at all or that he can not use for some time.

It seems a reasonable principle that live stock, wool, or any commodity offered in large numbers or amounts will market to better advantage to the seller when broken up into as many distinct lots as the offering includes and each sold on its merits. Good lambs or good wools look and sell much better in a lot by themselves than when mixed with inferior and unattractive stuff. Poor lambs or poor wools look and sell much better by themselves than when mixed with those of higher quality and value.

Aside from added returns from wool and of even greater importance to the grower is the information that such a system furnishes regarding the proportions of each type of wool contained in his clip and the value of each to the manufacturing industry. This allows an accurate determination of the profit from various classes of sheep yielding peculiar types of wool. It may and often does happen that the heavier fleece of wool of slightly lower value per pound yields more profit than a lighter fleece having a higher value per pound. Separate sale of different classes of wool permits the sheep breeder

to determine definitely which class of sheep is most profitable under his conditions.

It is yet too early to say how far and in what way the principles of Australian wool classing and selling can profitably be adopted in the United States. There is nothing in the nature of American sheep or ranch conditions that constitutes an insurmountable obstacle to the employment of even the details of Australian shearing and classing of wool. The great and quite firmly established difference is in the methods of selling. The plan of preparing wool as followed in Australia is possible there because their auction system of selling permits a ready sale of a lot as small as one bale, or 400 pounds of wool. The minimum size of offering that can be satisfactorily disposed of in the American wool trade is 6,000 pounds, and few buyers care to purchase lots of less than 10,000 pounds. This is true because most American wools are purchased by manufacturers' buying representatives in large lines of single grades from dealers who have purchased numerous entire clips at a lump price per pound. Ordinarily each clip contains a considerable amount of each of a number of grades. By combining the few thousand pounds, say, of fine staple wool from one clip with the same kind from one or more other clips, a marketable offering can be made up.

The success of ranch grading of wools is dependent upon the establishing of such selling arrangements as will permit the grower to receive a report showing the weight and selling price of each part of his clip. Under such a method of selling as is used in Australia a mill buyer can secure from any day's offering as large an amount as he needs of any one grade by buying lots of varying amounts of that grade, selected from over a million pounds that may be sold in the auction lasting only a few hours.

Since it is the growers who need and desire a readjustment of American wool-selling methods, it is they who must take the initiative and incur any risks connected with new methods. It is quite plain that the benefits of selling graded wool can not be realized when the clip is sold on the ranch and as a whole. It can not reasonably be expected that speculative buyers, accustomed to buying whole clips, will buy a clip in six or seven parts, neither can the manufacturer in need of, say, 50,000 pounds of a certain class of wool send his buyers to the ranches to bid upon even 10,000 or 15,000 pounds of such wool at a place and then more often than not fail to make a purchase.

The Australian style of auction could not be inaugurated with offerings of classed and catalogued wools equal to less than 20 per cent of the American clip. With 50,000,000 pounds of wool suitably put up and offered by auction for a number of years, that system of doing business might be established. But such a move would neces-

sitate cooperation among growers to an extent not likely to be possible for some years at least.

The only other means of securing the results sought in auction selling is to consign classed or graded clips to commission saleshouses and permit them to combine different parts of various clips such as may be necessary to make up offerings of size suitable to the trade. This is the practice of interlotting described on page 26. Such practice can succeed only when the grower feels that his selling agent, whether it be a cooperative or a private concern, will act fairly and use only wools of similar value in the combined offerings.

Such selling facilities, or any others that are practised, can by no means remove the need of selling houses or firms to get the wool to the manufacturers. Such intermediate agencies may in the future consist more largely than at present of commission sellers, though it is unlikely that the time will ever come when no wool will be bought and held for market rises.

COOPERATIVE SHEARING SHEDS IN NEW ZEALAND.

In New Zealand the sheep raisers are equally as determined as those in Australia to have their wool clips well put up. A few farmers keeping very small flocks do not skirt or class their fleeces, and such clips commonly go to speculators, who do the skirting and classing and in selling combine various purchases so reworked.

Some owners of medium-sized flocks (1,000 to 5,000) cooperate in the ownership and operation of a common shearing plant. Each sheep owner using the shed holds shares of stock in the plant in proportion to the size of his flock. Prior to shearing time the stockholders meet and agree upon a salary for a superintendent selected by them for the season's run. This superintendent hires shearers, shed hands, and a classer, purchases supplies, and in fact does all the business connected with the work, delivering to each stockholder his classed clip in bales, and the season's expense is paid by the stockholders on the basis of the number of sheep shorn for each.

EDUCATION OF WOOL GROWERS AND THEIR EMPLOYEES.

Australia has five agricultural colleges, with a total annual attendance of about 1,000 students. At each college students are given as a part of the agricultural course instruction in the handling of the wool at shearing time, and are required to assist in the work. Other sheep than those owned upon the college farm are sometimes shorn in order to prolong the run and permit each student to take part in each phase of the work. Bales of unskirted or unclassed wools are often purchased to be used as laboratory material in teaching the best methods of preparing a clip of wool for the market.

Agricultural college students also receive instruction upon the breeding and rearing of sheep, though in these lines also most of the time and attention is devoted to practical work. The agricultural college courses are planned equally for prospective farmers and pastoralists.

Apart from the agricultural colleges, instruction pertaining to wools is included among the subjects offered in the technical colleges, schools, and trade schools, of which each State has its own system. New South Wales has 3 technical day schools with two-year courses, and 2 trade schools. In Victoria 20 technical schools receive State aid and 7 of them teach trade subjects. About 40 students were attending classes in wool classing and sorting at the Working Men's College in Melbourne, Victoria, in 1914. The course in wools offered by this college covers two years, students attending 27 hours per week for 40 weeks each year. The work is divided into three grades, outlined as follows:

FIRST GRADE.

To point out any portion of the fleece.

To skirt a fleece properly.

To roll a fleece properly.

To sort skirtings according to their commercial value, making "necks," "broken," "first," "second," and "stained" pieces and "locks," and be able to sort 40 pounds in 30 minutes.

To skirt "bellies" and remove stains where necessary.

To explain what is understood by the terms "combing" and "clothing," and to divide the wool into these two classes.

SECOND GRADE.

To be thoroughly competent in all first-grade work.

To distinguish the following descriptions of wool: Merino, greasy and scoured; comeback, greasy and scoured; quarter-bred, greasy and scoured; half-bred, greasy and scoured; three-quarters bred, greasy and scoured; and Lincoln, greasy and scoured.

To class wool into these qualities.

To be able to sort 28 pounds per hour into these qualities.

To explain the means used in preparing wools for market, as, for instance, "greasy," "scoured," and "fellmongered" wool.

To be able practically to class crossbred fleece and lambs' wool into their respective grades ready for the market, and to class Merino wool, making the distinction between "combing," "clothing," and "tender" wool.

To explain how "crossbred" and "comeback" wools are produced, illustrating by specimens of wool what each crossing will produce.

THIRD GRADE.

To be thoroughly competent in all first and second grade work.

To sort Merino and crossbred wools into all their lengths and qualities.

To sort lambs' wool, either Merino or crossbred, into all its trade qualities.

To sort crossbred and Merino fleeces into trade qualities.

To give an approximate yield of clean wool from greasy.

Certificate will be given only to those passing in the three grades. Before a certificate will be issued, a report from the owner or representative for efficiency in "wool rolling" and "piece picking" during one month's work in a shed of at least 10 shearers must be obtained, and the student must class the wool, supervise piece pickers and wool rollers in a shearing shed to be named for one run (1 hour and 20 minutes) to the satisfaction of two examiners.

New Zealand has day technical schools which include agriculture as one of the studies. Technical work, including such subjects as wool classing, was taught at 132 centers in 1913. At 70 per cent of these centers 1,700 students were taught "wool sorting and classing, shearing, dairying, veterinary service, agriculture, and horticulture." The Christchurch Technical College has a term of three months and requires an attendance of nine hours per week in the course on wool classing. The outline of the course is as follows:

Students are taught how to pick up, roll, skirt, class, and bale wool for the Colonial, London, Continental, and American markets.

Farmers are instructed how to flay and prepare sheep skins and hides for market, both in the dry and green state, and valuation of same at per skin and by weight.

Notes and short lectures are given weekly.

Wool sorting is taught according to Bradford Spinners' Count Qualities, ranging from 32's to 80's.

Second-year students are taught how to estimate the clear yield of wool on a top and noil basis.

The education pertaining to wools offered in Australia and New Zealand is mainly calculated to aid production and train young men for employment with woolgrowers. The only instruction in wools offered in the United States is at a very few textile colleges, which prepare their students to engage in some phase of the manufacture of woolen goods. Although the position of the sheep industry in this country is not relatively so prominent as in Australia, yet its present status and need of development call for educational facilities that do not now exist. There are great areas in the Rocky Mountain and other Western States which in the interests of public welfare and true economy should always be used for sheep raising. While it is beyond the present scope of State institutions to conduct experiments on a scale commensurate with that of ordinary range operations, men and facilities are available for giving instruction that will help to put wool production upon a more skillfully conducted and remunerative basis.

SHEEP RAISERS' ORGANIZATIONS.

Six strong pastoralists' associations in Australia are federated to form a single body, called "The Pastoralists' Federal Council of

Australia." This council consists at present of 12 members, who represent various associations or unions in the States. The purpose of this council is to make orders and regulations to insure unity of action by the federated associations. An important object of all the pastoral associations is to adjust labor matters for their members. They also represent their members in all matters affecting the occupation and development of land for stock farming and grazing purposes.

The relation of local unions or associations to the federal council is shown in the case of the United Pastoralists' and Grazing Farmers' Association of Queensland. This association comprises five district associations, having a total membership of 880 stock owners, representing 63 per cent of the sheep and 28 per cent of the cattle in the State. Each of the district associations holds its own annual meeting.

The executive offices of this State association furnish advice and make representations to the Government land department. During the 1914 meeting discussions were held and action asked or taken on such questions as methods of assessing rates on pastoral holdings, insurance of employees' and members' products, stock stealing, minimum area of grazing farms and homesteads, and extension of leases. During the year members were advised as to action in 19 cases of disputes with shearers and shed hands. Other organizations represented in the federal council have similar functions and subsidiary organizations.

PROBABLE EXTENT OF FUTURE IMPORTATIONS OF MUTTON AND WOOL FROM AUSTRALASIA.

In the minds of many American farmers there exists an uncertainty regarding the influence upon the future course of prices of importations of mutton and wool. Australia and New Zealand are regarded by some as likely to greatly increase their production and supply our markets and thus depress the price of the home-grown products.

These countries can increase their production to a considerable extent. Such an increase can not be a sudden one, and it is doubtful if an additional output can be produced at a lower cost than is possible by the use of the best methods in the United States. None of the land now unoccupied in New Zealand is capable of producing really high-class mutton or wool. An increase of that country's sheep population is to be looked for chiefly through more seeding of natural pastures and the cultivation of forage crops on present natural or artificial grass areas. With the ruling cost of labor and the comparatively slow rate of increase in population, the advance toward any system requiring an increase of labor is likely to be gradual.

In Australia there is a great deal of territory available for new flocks. Much of it, however, is subject to rather frequent droughts,

while labor conditions and restricted construction of railroads render improbable any rapid development. In much of this newer country it requires around 3 acres to support a sheep. Those competent to judge state that the present rate of increase in the sheep population of the interior no more than balances the loss in the moister coastal areas that have supported three sheep per acre and which are now being used more largely for dairying.

Even with favorable seasons and aggressive development in Australia it is improbable that the proportion of the increase reaching the United States would seriously affect our market values. The United States is now one of the small importers of Australasian meats. It may be desirable for shipping companies to divert larger supplies to our ports to furnish eastbound cargo for vessels carrying back American manufactures. With an even greater meat shortage in the other countries receiving Australasian meats than exists here, prices are not likely soon to divert large amounts from European destinations into our markets.

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